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S. H. McCrory on December 3 attended the early sessions of the Power and Machinery and the Structures Divisions, A.S.A.E. at Chicago. Then he went to Minot, North Dakota, for an extended conference with L.M. Winsor, concerning the plans for engineering structures being designed for migratory waterfowl refuges under establishment by the Bureau of Biological Survey. After brief stops in St. Paul and Chicago, he reached Washington, December 23.

H.S. Riesbol reports soil loss in tons per acre on the Guthrie Station for the year 1934 for four terraces with different grades. The terraces are all 1,500 feet long, located on an average land slope of 5 percent, with vertical interval of 3.5 feet. The field was planted to oats during the spring rains and was in fallow for the fall rains. Terrace grades and soil losses were, respectively, as follows: 6 inches per 100 feet, 9.03 tons per acre; 4 inches per 100 feet, 6.13 tons per acre; 2 inches per 100 feet, 3.48 tons per acre; and the level terrace lost 1.21 tons per acre.

According to Raymond R. Drake, the total precipitation at the Hays Station for the year 1934 up to December 1 amounted to only 16 inches as compared to a normal of 22 inches.

R. A. Norton reports that for the twelve months period ending Oct. 31, the Clarinda Station showed a total rainfall shortage of 13.51 inches.

Ralph W. Baird attended the meeting of Power and Machinery Division of the American Society of Agricultural Engineers in Chicago, Ill., on December 3, 4, 5, and 6. He was chairman of the symposium on Variable Field Requirements of Terracing Equipment, and presented a paper on this subject.

On November 26, 27 and 28, as reported by A. T. Holman, the Bethany Station was visited by 111 farmers, county agents, engineers, and foresters. These visits were initiated by the Missouri Extension Service self-help plan for erosion control.

During the first week in December W. D. Ellison, L. C. Tschudy, J. D. Parsons, and C. L. Hamilton, attended the erosion-control conferences of the A.S.A.E. at Chicago. At these conferences it was decided to try to improve the value of the ECW work wherever possible by working on valuable agricultural lands and securing more cooperation from the landowners in terracing and other erosion-control work.

A broad conservation program has been developed in Oklahoma and Texas whereby the camps lay out terraces, and farmers construct them and make the earth fills, utilizing teams and tractor power wherever possible. After the completed terrace system is assured and outlet channels constructed, camps then construct permanent outlet-channel protection works which are largely hand-labor jobs. A recent survey showed that the landowners in Texas bear 47 percent of the cost of this class work. The hand-labor supplied by the camps is thus utilized in a very effective manner. After attending the meeting at Chicago, the ECW technicians, together with E. M. Bruner, District Forest Inspector of Milwaukee and several State technicians, visited a number of camps in Oklahoma to inspect this work to determine how the program might be applied in their own States.

Experimental tile specimens were collected by D. G. Miller from field installations at Enderlin, N. Dak., Medicine Lake, S. Dak., Grand Rapids, Coon Creek, and University Farm, Minn., and from Madison, Stevens Point and Phillips, Wis. and from Wilson, N. C. Between 1,200 and 1,500 cylinders exposed under various conditions in peat and alkali soils are now ready for testing. These tests are of unusual interest this season because some of the cylinders have been buried in peat soils for periods as long as 5 to 10 years.

A. Lincoln Fellows retired from his position as senior irrigation engineer with the Division of Irrigation, November 30, in accordance with the requirements of the retirement law, having been connected with that Division continuously since 1918. Mr. Fellows was born in Maine in 1864 and graduated from Yale University in 1886. His Government service included the positions of resident hydrographer with the Geological Survey and district engineer of the Reclamation Service (Rocky Mountain Region). He also served as deputy State engineer of Colorado, State engineer of North Dakota, secretary and general manager of the engineering firm of Field, Fellows & Hinderlinder, of Denver, engineer member (2 years president) of the Denver Public Utilities Commission, and city engineer of Denver and member of its Board of Public Works. One of his outstanding accomplishments was the exploration of the Grand Canyon of Gunnison River, in order to obtain data for the Uncompahgre Valley Project of the U.S. Reclamation Service. He also outlined the boundaries of the Forest Reserves in Colorado and Mesa Verde National Park.

Mr. Fellows' separation from the Government service is regarded as a distinct loss by his associates, especially those in the Berkeley office, with whom he had been associated for the past six years. His wide knowledge and practical experience along agricultural engineering lines enabled him to render service of the greatest value as a consultant on many phases of the work of the Division, and in editorial work.

As a means of measuring the quantity of water that will pass through the 3.85-mile Independence Pass Tunnel near Leadville, Colo. which will divert water from the western slope of the Continental Divide and the Colorado River drainage and deliver it on the head waters of the Arkansas River on the eastern slope, an 8-foot Parshall measuring flume has been designed by R. L. Parshall. This is the first major transmountain diversion in the southern part of Colorado, and the water officials are much concerned as to the accuracy of the measurement of this diversion. It is the present plan to line the tunnel in part, and the maximum discharge at first will probably not exceed 350 second-feet. The later completion of the lining is expected to increase the capacity to 650 second-feet. It is proposed to install the Parshall measuring flume about 200 feet from the east portal of the tunnel.

In connection with his assignment as engineering advisor on water conservation projects for the New Mexico Relief Administration, Harry F. Blaney was appointed a member of the Committee on Water Resources and Their Utilization, of the New Mexico State Planning Board. At a meeting of this committee, water conservation projects to be built by State and Federal governments were discussed and a plan to survey the underground water resources of the State was presented.

Because of the extreme dryness of the soil in the vicinity of Scottsbluff, Nebr. Leslie Bowen recommended that farmers apply a fall irrigation to their lands where and when water was available. Such a practice is some-

what new for that area, but it is believed to be advantageous under existing conditions. No landowners served with storage water are able to do this but there is a considerable acreage which obtains its water directly from the river and in such cases the idea is feasible this season.

Karl Harris submitted a report on "Water Requirements of Washington Navel Orange, Grapefruit, and Date Trees in Salt River Valley, Arizona", which presents the results of three years' study in cooperation with the Arizona Agricultural Experiment Station. It is expected this will be published by the Experiment Station. Mr. Harris made a trip to the Berkeley office, stopping en route at points in southern and central California to inspect methods used in citrus and cotton irrigation.

With further reference to the annual meeting of the Joint Committee on Fertilizer Application mentioned in the November Newsletter, the committee decided to undertake a survey of present methods of applying fertilizer to horticultural crops, since it is a comparatively new field of research. In general, the results of the 1934 fertilizer-placement studies indicated that fertilizer is most effective for beans, corn, cotton, potatoes, and tobacco when placed in a band at each side of the row. Studies with beans and cotton showed that a band at one side of the row was as effective as a band at each side. Placement of fertilizer either immediately under or mixed with the soil around the seed or seedling roots was usually the least desirable. The common method of "bedding on" fertilizer for cotton several days in advance of planting was indicated to be slightly inferior to side applications at time of planting. As a result of the fertilizer-placement work in which the Bureau has taken a major part, several new machines or attachments for applying fertilizer in a band at each side of the row for beans, corn, cotton, and potatoes were placed on the market during the past year.

A. L. Sharp has been located at Pompano, Fla. during the past month in connection with planting operations for fertilizer-placement experiments with snap beans.

Forty employees of the Washington office inspected the Bureau laboratory and equipment at the Arlington Experiment Farm on December 5. Various experimental machines and apparatus used in connection with the studies of grain cleaning, scarifying, and harvesting machinery and fertilizer-distributing machinery were exhibited and demonstrated.

In response to a request from the Bureau of Plant Industry, the Division of Mechanical Equipment is developing and testing equipment for use in treating seed grain. Some of the wheat, oats, barley and grain sorghum which will be allocated to the drought areas is infested with smut, and will be treated before planting to prevent the spread of the disease. W. M. Hurst and W. R. Humphries have been assigned to this work.

The following members of the Division of Mechanical Equipment attended the Power and Machinery Division meeting of the A.S.A.E. in Chicago, Dec. 3 and 4: R. B. Gray, R. M. Merrill, C. K. Shedd, and Thayer Cleaver. C.K. Shedd presented a paper on "The Basin Method of Planting Corn", prepared by Professors Collins and Davidson and himself. W. M. Hurst prepared a paper entitled "The Field for Small Combined Harvester Threshers."

R.B. Gray spent December 5 and 6 at Chicago at the meeting of the combination A.S.A.E. and S.A.E. Agricultural and Industrial Tractor group.

R. M. Merrill visited The Homestead Valve Manufacturing Co. at Coraopolis, Penn. on December 7 to investigate the possibilities of a new

type of spraying equipment developed by that company.

The coverage tests in a heavy broomcorn growth near Arcola, Ill. during the month of November, as reported by Thayer Cleaver, indicate that such heavy growths of plant material can be successfully covered if plows have sufficient clearance and are equipped with proper attachments. The common practice is to burn broomcorn stalks previous to plowing, but the plows in these tests covered the broomcorn growth even much better than most plows cover the broomcorn growth that is left after burning. These coverage tests were made by the Agricultural Engineering Department, University of Illinois, and the Division of Mechanical Equipment, Bureau of Agricultural Engineering, cooperating.

During the week of Dec. 3 to 7 the Colorado Agricultural College conducted a Farm and Home Week, at which E. M. Mervine had an exhibit of some of his experimental beet machinery and of some of the recent developments of the implement industry, especially showing tractor equipment applicable to sugar-beet production.

The possibility of developing more efficient nozzles for orchard spraying at lower pressures is being investigated by E.M. Dieffenbach at Albany, Ca. Several low-pressure nozzles have recently been received from manufacturers of power-plant cooling-pond equipment, in order to be able to test them for possible use in orchard spraying.

The project on methods and equipment for mixing molasses with fodder as a drought relieve measure in regions where feed is scarce, on which O. K. Hedden is cooperating with the Bureau of Agricultural Economics, is nearing completion and a report thereon will be presented in the near future.

Wallace Ashby attended the meeting of the Structures Division, A.S.A.E., at Chicago on December 3 and 4, afterwards going to Madison, Wisc. where he visited the Forest Products Laboratory and the Department of Agricultural Engineering of the University of Wisconsin. With Mr. Witzel and Dr. M.E. Diemer of Madison he visited the J. B. Ford farmhouse which has been remodeled and of which a motion picture film is being prepared.

A paper entitled "Outline of Investigations by the United States Department of Agriculture in Fruit and Vegetable Transportation", by W. V. Hukill was presented by him before the American Society of Refrigerating Engineers meeting in New York, December 5 to 7.

The following publications have been issued during the past month:

"Annual Report of the Bureau, 1934".

Leaflet 107 "Barrel Seed Scarifier" by W.M. Hurst,
W. R. Humphries and Roland McKee.

Circular 335 "Distillate Burners"
by Arthur H. Senner.